derive equal benefit from the meteorological service if inland stations are established and care is taken that the general population of the country are taught how to appreciate their work. Dr. Neumayer concluded with the sentence:—It is not only the duty of the State to found beneficial institutions and to organise them efficiently, it is also the duty of the State-citizen to learn to understand and to appreciate these institutions and to enter into this spirit of the work they are called upon to perform.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

St. Andrew's.—The Senatus Academicus of St. Andrew's University have conferred the degree of LL.D. upon Mr. Henry Woodward, F.R.S., of the British Museum, and Dr. W. C. Macintosh, of Murthly, well known for his researches on British annelides.

The Yorkshire College, Leeds.—Mr. Arnold Lupton, F.G.S., has been elected Instructor of Coal Mining, a department recently endowed by the Drapers' Company of London.

Higher Education of Women.—A public meeting composed for the most part of ladies, was held on the 6th instant in the Vestry Hall, Kensington, to inaugurate the system of lectures for the higher education of women, undertaken by the Principal and Professors of King's College with the co-operation of the Women's Educational Union. The object of the lectures, which commenced on the 11th instant, is to supplement and continue school education, and the instruction will have, as far as possible, reference to the examinations open to women in the University of London or elsewhere. The minimum age of students is fixed at 17, except in such cases as receive the special sanction of the committee. The classes will be at present held in the Vestry-hall, High Street, Kensington. The curriculum embraces Holy Scripture and Church history, logic and moral philosophy, modern and ancient history, the English, Latin, French, and German languages and literatures, mathematics, mechanics, and botany. Experimental physics, chemistry, and drawing will also be taught as soon as suitable arrangements can be made. Other classes, if necessary, will also be formed. The fees vary from 10*s*. 6*d*. to 2*l*. 2*s*. per term; for any four complete courses they will 6*l*. 6*s*. For ladies engaged in teaching there will be a remission of 25 per cent.

Prizes in Botany for Young Women.—The Society of Apothecaries of London announce their intention to award prizes to young women students in botany for proficiency in that science, the prizes to be competed for under the following conditions:—The competition will be open to all young women who shall produce from their teachers certificates that their age at the time of examination does not exceed twenty years. The examination will be in general and not medical botany. It will consist of questions both written and oral, in—(1) Structural Botany; (2) Vegetable Physiology; (3) Description of Living Plants; (4) Systematic Botany; so far as these subjects are contained in Sir Joseph Hooker's "Science Primer—Botany," and in Prof. Oliver's "Lessons in Elementary Botany." The first examination will take place in London on the third Wednesday and the third Friday in June, 1878. Candidates will be required to send their names and their residences, at least fourteen days before the examination, to the Beadle, Apothecaries' Hall, Blackfriars, E.C., when they will receive tickets of admission to the examination.

France.—M. Bardoux, the French Minister of Public Instruction has taken preliminary steps for organising at Paris on the occasion of the Universal Exhibition, a great congress of schoolmasters. A delegate from each district will be sent by his fellow-teachers. Not less than 4,000 are expected to be present.

M. Bardoux has again taken up in the French Chamber the proposed erection of new schools in France. M. Waddington was the originator of the scheme. It is intended to build no less than 17,320 new school-houses, and purchase, enlarge, or restore 12,000 others.

SCIENTIFIC SERIALS

Verhandlungen der k.k. zoologisch-botanischen Gesellschaft in Wien (vol. i., 1877).—This volume contains the continuations of, and additions to, several important papers commenced in the volumes for previous years. We mention particularly the mycological researches by Herr Schulzer von Müggenburg.—The other papers, of which some are very elaborate, are:—On *Cecidomyidæ*, by Dr. Franz Löw.—On the Diptera genus *Medeterus*, Fischer, by F. Kowarz.—On the fungus flora of Vienna, by W. Voss.—On some spiders from Madagascar, by Count E. Keyserling.—On some American spider genera from the families *Pholcoidæ*, *Scytodoidæ*, and *Dysderoidæ*, by the same.—On the *Holothuria* fauna of the Mediterranean, by Dr. Emil von Marenzeller.—On *Psyllodæ*, by Dr. Franz Löw.—On the *Chalcidiæ* genus *Olinx*, by Dr. Gustav Mayr.—Coleopterum, species novae, by E. Reitter.—On the passage of *Pastor roseus* (Temm.) through Austria, Hungary, and the neighbouring countries in 1875, by V. von Tschusi.—Ornithological notes, by B. P. Hanf.—On the flora of Southern Istria, by I. Freyn.—On the lepidoptera fauna of the Dolomite district, by I. Mann and A. Rogenhofer.—On the coleoptera fauna of Central Africa, by P. V. Gredler.—The volume concludes with an interesting description of the piscicultural establishment of Herr A. Fruwirth at Freiland, near St. Pölten (Lower Austria), by Dr. E. von Marenzeller.

Memorie della Società degli Spettroscopisti Italiani, May, 1877.—A note on the solar eruptions during 1876, by Prof. Tacchini. Number of days of observation, 106; number of eruptions, 9, two on eastern limb and 7 on western limb.—Note by the same author on the present solar phenomena as compared with those during the maximum spot period; the number of eruptions observed at Palermo in 1871 were 97, while only one was seen in the first four months of this year.—Letter from Father Secchi to Prof. Tacchini on the above subject, also a letter between the same persons relative to Winnecke's comet.—Drawings of solar prominences for January and February, 1876, accompany this number.

June.—Note on a water-prism, by Father Secchi. Path of solar protuberance observed at Rome in April, 1877; same for May.—Note by Prof. Tacchini, on a metallic solar eruption seen in June last; the following lines were visible in the spectrum: b^1, b^2, b^3, b^4, 1474*k*, 4923*A*, 5017*A*, sodium, 5369*A*.

July.—Continuation of the above note.—Note by Prof. Millosevich, on the contact of Mercury with the sun's chromosphere on May 6, 1878.—Drawings of the chromosphere for the months of March, April, and May, 1876, accompany this number.

August.—Note on the zodiacal light, by Prof. Serpieri.—Announcement of the death of Eduardo Heis.—Description of a new form of gravity escapement, by Prof. Young.—The spectroscopic drawings of the chromosphere for June and July, 1876, accompany this number.

September.—A paper on the discovery of oxygen in the sun by photography, and a new theory of the solar spectrum, by Prof. H. Draper. [This discovery, and all matter relating thereto, have already been fully reported in our columns.]—Table of solar protuberances observed at Rome in June, 1877.—Table of solar spots seen at Palermo in July and August, 1877. Four maps, together with a preface by Prof. Heis explaining them; the maps are of a portion of the heavens adjoining the ecliptic, and show stars down to the fifth magnitude, and they are for use in determining the position of the zodiacal light.

Journal de Physique, January.—On the employment of rotating discs for the study of coloured luminous sensations, by M. Rosentiehl.—On the use of the radiometer as an apparatus of demonstration, by M. Violle.—Rheostatic machine, by M. Planté.—Experimental researches on the interferences of light, by M. Righi.

SOCIETIES AND ACADEMIES

London

Royal Society, January 10.—"On the Structure and Development of the Skull in the Common Snake (*Tropidonotus natrix*)," by W. K. Parker, F.R.S.

"Observations on the Nervous System of *Aurelia aurita*," by Edward Albert Schäfer, Assistant-Professor of Physiology in University College, London. Communicated by W. Sharpey, M.D., LL.D., F.R.S.

January 24.—The Cortical Lamination of the Motor Area of the Brain," by Bevan Lewis, F.R.M.S., Pathologist and Assist. Med. Officer to the West Riding Asylum, and Henry Clarke, L.R.C.P. Lond., Med. Officer to the West Riding Prison.

Communicated by D. Ferrier, M.A., M.D., F.R.S., Professor of Forensic Medicine, King's College, London.

January 31.—"Further Researches on the Minute Structure of the Thyroid Gland." Preliminary Communication. By E Cresswell Baber, M.B. Lond. Communicated by Dr. Klein, F.R.S.

"On the Limits to the Order and Degree to the Fundamental Invariants of Binary Quantics," by J. J. Sylvester, M.A., LL.D., F.R.S., Professor in the Johns Hopkins University, Baltimore, U.S.

"Remarks connected with the Number of Figures in the Periods of the Reciprocals of Prime Numbers," by William Shanks, communicated by Rev. Dr. Salmon, F.R.S.

Linnean Society, January 17.—Prof. Allman, president, in the chair.—Specimens of Dipterocarpaceæ collected by Signor Beccari, in New Guinea, were exhibited and commented on by Mr. Thiselton Dyer.—Attention was drawn by Mr. E. M. Holmes to a Japanese book containing sections of native woods botanically named in English, Latin, and Japanese.—Several examples of fasciated stems of the Fuller's Teazel (*Dipsacus fullorum*) were exhibited by Mr. J. R. Jackson, who stated these curiously malformed stems were now successfully introduced for the handles of sunshades; he also made remarks on a bird's nest formed of wool and cotton-pod, sent by Sir Bartle Frere to the Kew Museum.—Prof. Owen then read a paper on *Hypsiprymnodon*, a genus indicative of a distinct family in the Diprotodont section of the marsupials. The animal in question is an inhabitant of the Rockingham Bay district, Queensland, and sparingly frequents the dense, damp scrubs bordering the coast. It is diurnal, and feeds on insects, worms, and tuberous roots, or palm berries, holding these in its fore-paws, and sitting on its haunches, after the manner of the phalangers. They breed during the rainy season, February to May. Both sexes have a musky odour, are nearly alike in size, and somewhat over a foot long. This Rat Kangaroo (*H. moschatus*) Mr. Ramsay, of Sydney, first named and gave a short description of, and Prof. Owen now supplements by a fuller account of its skeleton, &c. Besides peculiarities in dentition and skull, the latter dwells on the structural conditions of the hind foot, a modification between that of the Potoroos and Kangaroos. He thereafter enters into comparisons with the feet of the ostrich group (*Struthionidæ*), and speculates on the modifications of the five-toed feet revealed by palæontology, and as applicable to the living marsupials &c.—Mr. Francis Darwin's communication, experiments on the nutrition of *Drosera rotundifolia*, we gave an abstract of in NATURE, vol. xvi. p. 222.—Notes touching recent researches on the Radiolaria, was the title of a paper by Prof. St. G. Mivart. In this *résumé* the history, progress, and present condition of the subject are elucidated. These remarkable marine surface-swimming organisms the author proposes to arrange after the classification adopted by Prof. Haeckel, but considerably modified. The primary groups are reduced from fifteen to seven as follows:—1. Discida; 2. Flagellifera; 3. Entosphorida; 4. Acanthometrida; 5. Polycistina; 6. Collozoa; and 7. Vesiculata.—Mr. J. Kerswill was elected a Fellow of the Society.

Anthropological Institute, January 29.—Mr. John Evans, D.C.L., F.R.S., president, in the chair.—Anniversary Meeting.—The president, in the course of his address, alluded to the late conference on the "Antiquity of Man," and expressed his opinion that the question might be discussed with as great advantage from a purely English point of view, as from one embracing a larger area, which to some extent held good with regard to the question as to whether the palæolithic implements of the river-gravel might not be referred to an interglacial period. As to the relics of human workmanship thought to have been discovered in beds of pliocene and even miocene age in Italy, Switzerland, and France, Mr. Evans again on this occasion repeated the words of caution he had previously expressed, but nevertheless believed that eventually traces of man would be found of an earlier date than that which can be assigned either to the cave or river-gravels of Western Europe. These traces were to be rather looked for in the east than in the temperate west or colder north. A strong hope was expressed that Indian geologists would ere long solve in a satisfactory manner the date and origin of the so-called laterite deposits of Madras, but Mr. Evans was able to announce that in Borneo there appeared a chance of some cave explorations being carried on which will probably throw light on the date of man's appearance in that part of the globe. Mr. Everitt, whose experience in cave explorations is well known, has proposed to devote a year to further researches, and Mr. Evans having guaranteed the necessary funds appealed to all those who were interested in the early history of man or in palæontology to assist in raising the by no means inconsiderable amount. The following are the council elected to serve for the ensuing year:—President, John Evans, D.C.L., F.R.S.; Vice-presidents, Prof. George Busk, F.R.S., Hyde Clarke, Major-General A. Lane Fox, F.R.S., Francis Galton, F.R.S., Sir J. Lubbock, Bart., M.P., D.C.L., F.R.S., Prof. Rolleston, M.D., F.R.S.; Directors and Hon. Secs., E. W. Brabrook, F.S.A., W. L. Distant, J. E. Price, F.S.A.; Treasurer, F. G. Hilton Price, F.G.S.; Council, J. Beddoe, M.D., F.R.S., James Bonwick, F.R.G.S., C. H. E. Carmichael, M.A., J. Barnard Davis, M.D., F.R.S., W. Boyd Dawkins, F.R.S., Capt. Harold Dillon, F.S.A., Prof. W. H. Flower, F.R.S., A. W. Franks, M.A., F.R.S., Charles Harrison, F.S.A., J. Park Harrison, M.A., Prof. Huxley, F.R.S., A. L. Lewis, R. Biddulph Martin, F. W. Rudler, F.G.S., C. R. Des Ruffières, F.R.S.L., Lord Arthur Russell, M.P., Rev. Prof. Sayce, M.A., M.R.A.S., E. Burnet Tylor, D.C.L., C. Staniland Wake, M. J. Walhouse, F.R.A.S.

Physical Society, February 2.—Annual General Meeting.—Prof. G. C. Foster, president, in the chair.—The president read the report of the Council for the past year. After pointing with satisfaction to the present condition of the Society, the report goes on to show how it is hoped to extend its usefulness in the future. In addition to a second edition of Prof. Everett's work on the C. G. S. system of units, the Council hopes very shortly to publish Sir Charles Wheatstone's papers in a collected form, and it is making arrangements for the publication, at intervals, of translations of foreign scientific papers, especially such as have had a marked effect on the progress of physical science. A portion of the funds of the Society is to be devoted annually to the formation of a library, and an exchange of publications is already made with various learned societies abroad. Special stress was laid on the distinctive object held in view at the formation of the Society, namely the exhibition, when practicable, of the experiments referred to in papers read at the meetings.—The following officers and council were elected for the ensuing year:—President, Prof. W. G. Adams, M.A., F.R.S.; Vice-presidents (who have filled the office of president), Dr. J. H. Gladstone, F.R.S., and Prof. G. C. Foster, F.R.S.; Vice-presidents, Prof. R. B. Clifton, M.A., F.R.S., W. Spottiswoode, LL.D., F.R.S; W. H. Stone, M.B., F.R.C.P., Sir W. Thomson, LL.D. F.R.S.; Secretaries, Prof. A. W. Reinold, M.A., W. Chandler, Roberts, F.R.S.; Treasurer, Dr. E. Atkinson; Demonstrator, Prof. F. Guthrie, Ph.D., F.R.S.; other Members of Council, Capt. W. de W. Abney, R.E., F.R.S., Prof. W. F. Barrett, F.R.S.E., Major E. R. Festing, R.E., W. Huggins, D.C.L. F.R.S., Prof. A. B. W. Kennedy, C.E., O. J. Lodge, D.Sc., Prof. H. M. McLeod, the Earl of Rosse, D.C.L., F.R.S., Prof. W. C. Unwin, B.Sc., R. Wormell, D.Sc. Prof. H. L. F. Helmholtz and Prof. W. E. Weber were elected Honorary Members of the Society. After votes of thanks had been passed to the Lords of the Committee of Council on Education for the use of the physical lecture room at South Kensington, as well as for the other advantages enjoyed by the Society, and to the several officers of the Society, the meeting was resolved into an ordinary one. The following candidates were elected Members of the Society:—M. T. Cormack, C. J. Faulkner, M.A., E. M. Jones, F.R.A.S., C. Leudesdorf, M.A., and C. E. Walduck.—Prof. S. P. Thompson exhibited a method of showing the lines of force due to two currents of electricity running in parallel directions. A plate of glass is perforated by two holes close together, which are traversed by one and the same wire, and this may be so arranged that the current traverses the parallel lengths in the same or opposite directions. If now the plate be held horizontally while the current passes, and fine iron filings be sprinkled on the plate, they will arrange themselves in the well-known forms. In the plates exhibited the filings had been fixed by gum, so that their arrangement could be exhibited to an audience by projection on a screen.

Chemical Society, February 7.—Dr. Gladstone, president, in the chair.—The following papers were read:—The alkaloids of the aconites, Part II.—On the alkaloids contained in *Aconitum ferox*, by Dr. Wright and Mr. Luff. The alkaloid pseudaconitin from *Aconitum ferox* forms crystallised salts with difficulty. Aconitin, from *A. napellus*, on the other hand, crystallises with facility. When acted upon by saponifying agents, pseudaconitin is converted into dimethylprotocatechnic acid, and a new base, pseudaconin; mineral acids saponify pseudaconitin; tartaric acid forms the anhydro-derivative apopseudaconitin. With glacial acetic, and benzoic acids an acetyl and a benzoyl derivative are respectively formed. The properties, constitution, &c., of the above substances have been investigated by the authors. The nitrate and the gold salt of pseudaconitin were obtained in the crystalline form.—Notes on the tannins, by Dr. Paul and Mr. Kingzett. The authors conclude that (*a*) the supposition that natural tannin from gall-nuts is a glucoside is doubtful, (*b*) the astringent principle common to cutch and extract of mimosa bark is shown to be a glucoside and to yield on decomposition, unfermentable sugar and a peculiar acid distinct from gallic acid.—On the estimation of phosphorus in iron and steel. by E. Riley. The author has instituted a series of experiments as to the relative value of the molybdate and magnesia processes for determining phosphorus; as a general result, he concludes that the molybdate process always gives results which are too low, and that the magnesia method is the only one to be trusted.—An inquiry into the action of the copper-zinc couple on alkaline oxy-salts, by Dr. Gladstone and Mr. Tribe. The action of the couple on these oxy-salts is of an electrolytic nature; nitrites and ammonia are at first formed, but ammonia is the final product, when nitrates are taken: chlorides are formed, when chlorates are decomposed, but no chlorites or hypochlorites could be detected. When ammonium nitrate is acted on at the boiling-point nitric oxide is evolved.—On a new method for the determination of boiling-points, by H. C. Jones. A glass tube 4 mm. internal diameter and 200 mm. long is bent into a U, so that the one end, which is open, projects 15 mm. beyond the other which is closed. The closed leg is filled completely, and the open leg partly, with mercury, and a bubble of liquid manipulated into the closed end of the U. On immersing the U in a paraffin path and heating the latter, the liquid boils and the temperature at which the levels of the mercury in the two limbs are equal is the uncorrected boiling-point of the liquid.

PARIS

Academy of Sciences, February 4.—M. Fizeau in the chair. —Telegraphic determination of the difference of longitude between Paris and the Observatory of the war depôt at Algiers, by MM. Loewy and Perrier.—Portable instrument for determining itineraries and geographical positions in journeys of exploration on land, by M. Mouchez.—On some applications of elliptic functions (continued), by M. Hermite.—New observations on chemical reactions of the effluve, and on persulphuric acid, by M. Berthelot. When binary compounds are acted on by the effluve one part is decomposed while the other forms more complex combinations. Persulphuric acid, as well as ozone and oxygenated water, is gradually destroyed when the external influence, under which it has appeared, has ceased to act.—On definite hydrates, formed by hydracids, by M. Berthelot.—Experimental researches on the fractures which traverse the earth's crust, particularly those known as joints and faults (continued), by M. Daubrée.—The vibrations of matter and the waves of the ether in phosphorescence and fluorescence, by M. Favé.—Transversal vibrations of liquids, by M. Dubois. He puts a little liquid, with vermilion in it, on the branches of a tuning-fork, or on a paper strip, over the open end of a sounding pipe, and studies the striæ formed in it.—On some results obtained in treatment of phylloxerised vines, by M. Boiteau.—Discovery of a small planet at the Observatory of Toulouse, by M. Perrotin. —Ditto at the Observatory of Marseilles, by M. Cottenot.—Note on some consequences of the theorem of M. Villarceau, by M. Lemoine.—On the employment of the graphic method for prediction of occultations and eclipses, by M. Hatt.—On a new note by M. Boussinesq relating to the theory of elastic plates, by M. Levy.—On the formula $2^n - 1$, by M. Pepin.—On the determinant whose elements are all the possible minors of given order of a given determinant, by M. Picquet.—On the similarity of the photographic *réseau* of the sun and the craters of the moon, by M. Lamey. A similar cause is inferred.—On the equation of Lamé, by M. Brioschi.—On the dark lines of the solar spectrum and the constitution of the sun, by M. Cornu. By arranging in order of quantity the elements volatilised at the sun's surface (from the position and relative brightness of the dark lines), he considers the composition of the absorbent layer to be similar to that of volatilised aerolites.—The elements present in the layer of the sun which produces reversal of the spectral rays, by Mr. N. Lockyer.—On the refraction of gases and vapours, by M. Mascart. The results are given for some substances of mineral chemistry. It is shown, *inter alia*, that refraction furnishes a method for determining divergences from Mariotte's law where direct experiments on changes of volume or measurement of densities are difficult.—On the repulsion resulting from luminous radiation, by Mr. Crookes.—Researches on accidental double refraction, by M. Macé.—New direct vision spectroscope, by M. Thollon. This has a central fixed part and two symmetrical movable systems (consisting of metallic plates connected by joints and having prisms fixed on them) capable of turning about fixed axes parallel to the slit.—On the densities of vapour, by M. Troost. The density of vapour of acetic acid takes its theoretical value, corresponding to four volumes, even at temperatures bordering on 120°, if a weak pressure be operated with.—Dissociation of carbonate of baryta, by M. Isambert.—Memoir on the solubility of lime in water, by M. Lamy. This solubility varies with the nature or origin of the lime, its state of molecular aggregation, the temperature of its preparation, its dehydration or recalcination, its duration of contact with water, and previous heating of the milk of lime.—On anhydrous trichloracetic acid, by M. Clermont.—On the combinations of quercite, by M. Prunier.—On the nature of the very volatile products contained in raw benzines, by MM. Vincent and Delachanal. Besides carburets of hydrogen and coal oils, the authors find ordinary alcohol, cyanide of methyl, and sulphide of carbon. —On the employment of rotatory discs for study of colour sensations (continued); harmony of colours, by M. Rosenstiehl.—On use of the polarising microscope with parallel light for determination of the mineral species contained in thin plates of eruptive rocks, by M. Levy.—On the leadhillite of Matlock, by M. Bertrand.—On a new density apparatus, by M. Pisani. —Experiments demonstrating the *rôle* of air introduced into the arterial and venous systems, by M. Feltz. Air introduced, even in a very small quantity, into the aortic system, works great mischief; introduced into the venous system it is almost without danger.—New researches on the function of mucedineæ and their property of inverting cane-sugar (*à propos* of a note by M. Gayon), by M. Bechamp.—Treatment of cancers of the breast by ischæmia of the mammary gland by means of vulcanised caoutchouc, by M. Bouchut.—Barometric differences between neighbouring stations, by M. Renou.—Remarks on M. Faye's note regarding relations between phenomena of terrestrial magnetism and the rotation of the sun, by M. Broun. —On the telephone, by M. Champvallier. It is possible to correspond telephonically on wires carried on posts which also support wires for ordinary telegraphy to an extent of at least ten kilometres, and probably much further.—On the telephone, by M. Breguet. The effect is improved by placing one or more vibrating plates (perforated at the centre) at about one millimetre in front of the ordinary plate of the telephone.—On the earthquake at Paris on January 28, by M. de Gannes.—On the same, by M. Lefebvre.

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